

LOW-TEMPERATURE GROWN HIGH QUALITY ULTRA-THIN CoTiO_3 GATE DIELECTRICS

ABSTRACT

A gate oxide and method of fabricating a gate oxide that produces a more reliable and thinner equivalent oxide thickness than conventional SiO_2 gate oxides are provided. Gate oxides formed from alloys such as cobalt-titanium are thermodynamically stable such that the gate oxides formed will have minimal reactions with a silicon substrate or other structures during any later high temperature processing stages. The process shown is performed at lower temperatures than the prior art, which inhibits unwanted species migration and unwanted reactions with the silicon substrate or other structures. Using a thermal evaporation technique to deposit the layer to be oxidized, the underlying substrate surface smoothness is preserved, thus providing improved and more consistent electrical properties in the resulting gate oxide.

"Express Mail" mailing label number: EL873858896US

Date of Deposit: December 20, 2001

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